FIRMWARE ANALYSIS AND COMPARISON TOOL

Firmware Analysis of Cisco/Linksys SRW2008 - 1.0.4

Meta Data

HID	Cisco/Linksys SRW2008 - 1.0.4
Device Name	SRW2008
Vendor	Cisco/Linksys
Device Class	Switch (Managed)
Version	1.0.4
Release Date	2007-09-06
Size	3.22 MiB (3,378,139 bytes)

Analyses

base64decoder

Time of Analysis	2018-03-29 12:54:45
Plugin Version	0.1.2
Summary	Base64 code detected

binwalk

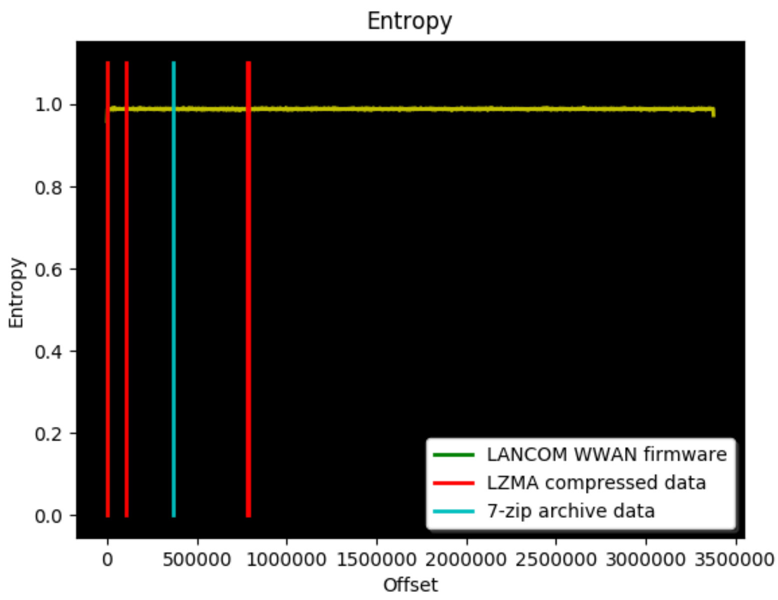
Time of Analysis	2018-03-29 12:57:40
Plugin Version	0.5

Signature Analysis:

```
DECIMAL HEXADECIMAL DESCRIPTION

81 0x51 LANCOM WWAN firmware
272 0x110 LZMA compressed data, properties: 0x5D, dictionary size: 8388608 bytes, uncompressed size: 550208 bytes
105822 0x19D5E LZMA compressed data, properties: 0x5D, dictionary size: 8388608 bytes, uncompressed size: 1049671 bytes
368135 0x59E07 7-zip archive data, version 0.2
781528 0xBECD8 LZMA compressed data, properties: 0x5D, dictionary size: 8388608 bytes, uncompressed size: 27900 bytes
790127 0xC0E6F LZMA compressed data, properties: 0x5D, dictionary size: 8388608 bytes, uncompressed size: 9596576 bytes
```

Entropy Graph



Summary:

LANCOM firmware header
VxWorks WIND kernel version ”2.6”
SHA256 hash constants
LZMA compressed data
eCos RTOS string reference: ”eCost”
Zip archive data
VxWorks operating system version ”5.5.1”
PARity archive data - file number 1
Copyright string: ”Copyright 1986-1997 Epilogue Technology Corporation”
GIF image data
StuffIt Deluxe (data): TD
Copyright string: ”copyright = ”&copy”;”
Copyright string: ”copyright = /&copy/g;”
mcrypt 2.2 encrypted data
eCos RTOS string reference: ”ecostrange”
Neighborly text
HTML document footer
Certificate in DER format (x509 v3)
eCos RTOS string reference: ”eCos - %d”
eCos RTOS string reference: ”eCosToQ(COSNum)”
MPEG transport stream data
OpenSSH DSA public key
Copyright string: ”Copyright 1997-1998 Integrated Systems
JPEG image data
Base64 standard index table

7-zip archive data
OpenSSH RSA public key
Copyright string: ”copyright
End of Zip archive
eCos RTOS string reference: ”eCosToQ(” –>”
Ubiquiti firmware header
XML document
eCos RTOS string reference: ”ecosmap”
HTML document header
LANCOM WWAN firmware
CRC32 polynomial table
Copyright string: ”Copyright 1984-2002 Wind River Systems
eCos RTOS string reference: ”eCosRuleToNetwork”
eCos RTOS string reference: ”ecosttrunks”

cpu architecture

Time of Analysis	2018-03-29 12:57:52
Plugin Version	0.3.1

crypto material

Time of Analysis	2018-03-29 12:57:41
Plugin Version	0.5

exploit mitigations

Time of Analysis	2018-03-29 12:57:54
Plugin Version	0.1.1

file hashes

Time of Analysis	2018-03-29 12:58:01
Plugin Version	1.0
imphash	None
md5	9665a7ad243bda91ce6312ed3aab305d
ripemd160	5e0313f309e610bece33bfece02a933bb80bc7b9
sha1	5ea563d79a7ed3f8c7a872e0bf31db9ef8c90711
sha256	b7c55a6de9fd1b85ec07f661b4d21638021999e2b1e754de1922f3b01f2cedb8
sha512	937f575dfffcfe1f986faf4ca8e3ba836f6d6f9dfaab582c4561fa93c7c2b 0ceee92efdb3e3e87abe0bbf9a867bd3f1169f27c06e7f467f549b0d40c3f814217
ssdeep	98304:nNasK108t/KzpM7NURKVt9RMN6sc0KzLgP:nNFK1Dt/KFMX0670KIP
whirpool	69477a040d3430dc6706d1bb6a4e2088814e24e6f3d73eb14b2e0e41aee6b a0220d98a4896b872abd558c9cd4945c7861e76fca8e6846f650940482c7697ce48

file type

Time of Analysis	2018-03-29 12:57:50
Plugin Version	1.0
File Type	ROS Container
MIME	firmware/ros
Summary	image/jpeg application/x-lzma firmware/ros application/x-7z-compressed text/plain application/x-java-applet image/gif application/octet-stream application/zip

init systems

Time of Analysis	2018-03-29 12:57:58
Plugin Version	0.4.1

ip and uri finder

Time of Analysis	2018-03-29 12:57:48
Plugin Version	0.4.1
IPs v4	1.0.4.1
IPs v6	:: 0:: 3:: ::c ::D 5:: ::7 ::6B ::4 B:: E:: ::9a9 A:: b::
URIs	list is empty
Summary: ::1 2.2.1.10 tftp://oob/10.1.2.3/saved-config	

```
2.2.1.17
176.212.0.0
0::
B::
1.89.64.5
64.4.1.5
4.1.89.98
1.1.1.8
1.1.1.14
10.1.2.2
1.1.1.6
tftp://10.0.0.6/saved-boot-image
10.1.1.3
1.1.1.7
::D
10.1.1.1
flash://filename
64.4.1.4
7.2.1.4
7.2.1.3
::6B
http://www.w3.org/1999/XSL/Transform
1.1.1.4
1.1.1.17
64.4.1.6
10.1.2.1
89.98.2.1
1.1.1.5
flash://image
tftp://ip
tftp://10.1.2.3/my_boot.rfb
10.0.0.6
64.4.1.8
10.7.10.1
0.255.0.0
tftp://oob/
tftp://oob/10.4.5.6/my_image.dos
1.3.3.1
255.255.0.255
64.4.1.1
4.1.89.64
10.1.2.3
64.4.1.9
1.1.1.9
2.2.1.1
1.1.1.16
tftp://10.0.0.9/commands-file
64.5.1.5
```

```
255.0.255.255
unit://2/image
tftp://10.0.0.6/saved-image
64.4.1.7
1.89.98.2
flash://startup-config
1.1.1.13
A::
1.1.1.15
1.89.64.4
0.0.255.0
192.168.1.254
5::
171.205.239.111
b::
0.9.6.1
2.2.1.16
::7
6.3.10.1
tftp://10.1.2.3/my_image.dos
224.0.0.0
::4
tftp://10.1.2.3/my_image.ros
3.6.2.4
2.1.10.7
7.2.1.16
224.0.0.255
::9a9
64.5.1.2
tftp://10.1.2.3/saved-image-file
1.1.1.10
255.255.255.0
2.1.16.1
64.5.1.3
1.1.1.19
3::
0.0.255.255
127.0.0.1
http://www.linksys.com
7.2.1.9
10.0.0.2
7.10.1.3
1.1.1.11
tftp://10.0.0.2/saved_cfg
1.6.1.1
64.4.1.3
0.255.255.255
2.1.31.1
```

```
7.2.1.10
1.1.1.2
e::
64.4.1.2
1.1.1.18
10.0.0.9
0.0.0.0
tftp://10.1.2.3/saved-config
239.255.255.250
E::
aposhttp://mynsURI
255.255.255.255
239.255.255.255
149.36.184.198
unit://3/image
10.4.5.6
10.1.1.2
1.1.1.3
7.10.1.4
64.4.1.11
tftp://oob/ip
1.0.0.0
::FFFF
9::9996
64.5.1.1
7.2.1.13
tftp://oob/10.7.8.9/my_boot.rfb
tftp://10.7.8.9/my_boot.rfb
0.0.0.255
::
64.4.1.12
2.2.1.11
unit://member/filename
255.0.0.0
224.0.0.251
1.0.4.1
64.5.1.6
7.2.1.8
http://www.openssl.org/support/faq.html
1.1.1.12
tftp://oob/10.1.2.3/saved-image-file
64.4.1.10
http://www.w3.org/1999/xhtml
10.7.8.9
http://www.linksys.com/
unit://4/boot
::c
tftp://10.4.5.6/my_image.dos
```

software components

Time of Analysis	2018-03-29 12:57:44
Plugin Version	0.3
Summary	OpenSSL OpenSSH GoAhead VxWorks 5.5.1 OpenSSL 0.9.8

printable strings

Time of Analysis	2018-03-29 12:57:47
Plugin Version	0.2
String Count	7262

users and passwords

Time of Analysis	2018-03-29 12:54:43
Plugin Version	0.4

string evaluator

Time of Analysis	2018-03-29 12:57:57
Plugin Version	0.2
String Count	7262

unpacker

Time of Analysis	2018-03-29 12:54:36
Plugin Version	0.7
Plugin	ROSFile
Extracted	6
Output:	

```
ROS PACK firmware archive payload extractor
Version 0.6
(c) Copyright 2015 TJ <hacker@iam.tj>
Licensed on the terms of the GNU General Public License version 2

Filename:       /media/data/fact_fw_data/b7/b7c55a6de9fd1b85ec07f661b4d21638021999e2b1e75
4de1922f3b01f2cedb8_3378139
File length: 3378139 (0x338bdb)
ARC Magic: LSS2
ARC Index: 1.01
Header version: 1
length: 48
Payload
length: 3378091 (0x338bab)
checksum: 430634778 (0x19aaf71a)
Link Time: 09:12:58
Link Date: 2007-09-06
Signature: PACK
Dir Entries: 6
Extracted CLI_FILE from offset 272 (105518 bytes)
Extracted DELSCRF from offset 105822 (262313 bytes)
Extracted EWS_FILE from offset 368135 (413361 bytes)
Extracted UPNP_FILE from offset 781528 (8407 bytes)
Extracted DATETIME_C from offset 789935 (160 bytes)
Extracted RSCODE from offset 790127 (2588012 bytes)

Payload length: 3378091 (0x338bab)
Payload extracted: 3378091 (0x338bab)
Payload checksum: 430634778 (0x19aaf71a)
Calculated checksum: 430634778 (0x19aaf71a)
```

Size Packed -> Unpacked	3.22 MiB -> 3.22 MiB
Entropy	0.90
Summary	no data lost data lost unpacked

malware scanner

Time of Analysis	2018-03-29 12:54:40
Plugin Version	0.3
MD5	9665a7ad243bda91ce6312ed3aab305d
System Version	0.2.6
Scanners Number	1
Positives	0

Scanners	ClamAV
Scanns	ClamAV :: result:clean ClamAV :: detected:False ClamAV :: version:ClamAV 0.99.4/24430/Thu Mar 29 06:23:16 2018